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Indian Explosives Act (IV of 1884).

Indian Petroleum Act (VII of 1899).

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## NINTH ANNUAL REPORT

OF THE

# CHIEF INSPECTOR OF EXPLOSIVES IN INDIA.

BEING HIS

*Annual Report for the Year ending 31st March  
1908*



SIMLA:

GOVERNMENT CENTRAL BRANCH PRESS.

1908.



# *Ninth Annual Report of the Chief Inspector of Explosives, India.*

No. 1075.

FROM

MAJOR F. G. SMALLWOOD, M. V. O., R. A.,  
*Offg. Chief Inspector of Explosives in India,*

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,  
DEPARTMENT OF COMMERCE AND INDUSTRY.

*Simla, the 30th June 1908.*

SIR,

I have the honour to submit herewith a report of the work of this Department for the year ending 31st March 1908.

2. Owing to the large amount of inspection work to be done, it was considered necessary to strengthen this Department Personnel by the appointment of another Inspector. The

Secretary of State sanctioned the appointment, and Lieutenant J. W. Turner, Assistant Commissary and Head Overseer, Proof Department, Balasore, was appointed second Inspector of Explosives on probation for two years with effect from 2nd December 1907.

On the 1st of March 1908 Major C. A. Muspratt-Williams availed himself of three months privilege leave combined with six months furlough, and I took over charge of the duties of officiating Chief Inspector of Explosives in India from that date.

3. During the year 1907, 126 licenses (or 6 more than in the previous year) were granted in British India under Rule 17 of Number of magazines. the rules to regulate the manufacture, possession and sale of explosives. The number of magazines licensed was 173, or 4 more than in 1906, and is in excess of the number of licenses granted, because in a number of cases firms have two or more magazines in one place under one license. A statement showing the number and location of the magazines and also the number of licenses granted in British India is given in Appendix A. It will be seen from this statement how widely dispersed these magazines are, and how in some cases they are situated in places very difficult of access, and consequently considerable time has to be spent in getting from place to place, which necessarily, to a certain extent, curtails the number of inspections that can be made during the year.

4. During the year 225 inspections of magazines were made. A number of magazines were inspected two or three times each. Inspection of explosives magazines during the year. Those magazines are inspected most frequently, which are situated in the neighbourhood of towns or in populous localities, or which contain large quantities of explosives, or any explosive, which on account of greater susceptibility to decomposition and consequent ignition, it is considered advisable to examine and test more than other explosives. The Roburite Factory at Karachi was also inspected twice. The

number of magazines inspected has been less than in the previous year, but this is due chiefly to the fact that during the last year considerable additional inspection work in connection with petroleum has been carried out by this Department. As most of the small magazines in the coal districts of Bengal and elsewhere are now in a satisfactory condition, it has not been considered necessary to have them inspected more than once a year, more especially as the large feeder magazines are inspected two or three times a year.

5. The magazines generally are reported to be in good order, and as usual, magazine owners have been found most willing to carry out recommendations even when involving considerable expense, and the thanks of this Department are due to them for making the duties of the Chief Inspector and Inspectors of Explosives easy in this respect.

6. The physical condition of all explosives in the different magazines during the year was found to be good with the exception of about 120 lbs. of gunpowder, a few pounds of dynamite, carbonite and gelignite and 102 coils of fuse stored in magazines in the Bengal Coal District and Gaya which were found to be damp and unserviceable and which were ordered to be destroyed.

7. During the year two cases of thefts of explosives were reported to this Department. The door of the magazine of Messrs. F. F. Christien and Company at Dhab was broken and about 20 lbs. of dynamite, 300 detonators and 149 coils of fuse were stolen. The magazine of Messrs. Gladstone, Wyllie and Company's Mica Mining Works at Bhagirath was broken into by wrenching off the metal staples of the outer door and 170 lbs. dynamite, 2,500 detonators and six bundles of fuse were stolen. Both these magazines are in the Hazaribagh District. There are, however, no regulations to ensure that thefts of explosives should be reported to this office, and I have reason to believe that thefts have been more frequent than these two recorded cases would lead one to suppose.

8. During the year under report, 411 licenses for the storage of non-dangerous petroleum, with which this Department has been concerned or consulted, were granted, an increase of 80. A list of these installations, corrected up to date, and showing the districts in which they are located, is given in Appendix B. In addition, of course, there are a number of storage godowns for the possession of non-dangerous petroleum in non-bulk, licensed by District officers of which this Department has no cognizance.

9. During the year the Chief Inspector of Explosives personally visited the large bulk oil installations at Madras, Karachi, Bombay, Calcutta, (Budge Budge and Narculdanga), Chittagong and Rangoon, and also the oil fields in Assam and Burma. A large number of the minor installations were also inspected by the Inspectors of Explosives. In all 432 petroleum inspections were made. An increase of 134.

10. The large installations were reported to be efficiently supervised.

There seems to me to be still one grave defect in their conception, to which I would invite the attention of both the Port authorities and the firms concerned. At present in case of fire, existing arrangements only permit of oil being pumped from one tank to another tank within the installation or danger zone. It would be easy to quote instances where every tank within a large installation has eventually participated in a conflagration.

No large installation can be considered really efficient until there is a safety or emergency tank right away from the oil area.

11. These are still in an unsatisfactory condition. Practically the only safeguard for the general public against the dangers of these minor installations is their containing wall to prevent an escape of burning oil.

The weak points in these containing walls are the drainage escape apertures and these are fitted with admirably designed valves. Unfortunately during my inspections I have found all the valves open although there had been no rain for months, and in some cases the screws actuating the valves had so rusted in their collars that they could not be shut down.

I have addressed oil firms on the subject and feel sure that they will do all in their power to ensure that the valves are kept closed unless actually required to be opened for drainage purposes.

12. The Assam oil fields and refinery have been inspected once and Burma twice. Important questions regarding the Burma oil Condition of oil fields. fields are now under the consideration of both the Government of Burma and the Government of India.

The existing arrangements for testing petroleum in Assam were found to be unsatisfactory and I have addressed the Local Government on the subject.

13. No accidents have occurred in the magazines or in the one explosives factory (the Roburite Factory at Karachi) on the books of Accidents. this office. An explosion (item No. 5 of Appendix C) occurred on the 5th April 1907 in a magazine at Jatachapur in the Chindwara District of the Central Provinces. It appears the licensee was granted a license under the Indian Arms Act to possess gunpowder and fuses but that other explosives were also kept in the magazine. The licensee was prosecuted under section 19 (b) of the Arms Act and fined Rs. 300. A list of accidents that have occurred with explosives, inflammable substances, dangerous goods, etc., between the 1st January and 31st December 1907, and have been reported to this Department is given in Appendix C and gives a short account of each one. It will be seen from a perusal of the details that the accidents have practically all been caused by gross neglect of ordinary precautions. In all there were 58 accidents causing 46 deaths and injuries to 60 people. Comparative statements given in Appendices D and E show the total number of accidents and number of persons killed or injured by them during the last five years. As stated in my previous reports it is doubtful whether all accidents that occur are reported to this Department and therefore it is possible that the statistics given are underestimated.

14. There were 11 accidents from gunpowder Gunpowder. causing 18 deaths and injuries to 20 persons.

15. Nitro-compounds were responsible for 4 accidents which caused injuries to 6 persons. These accidents were all due to misfires Nitro-Compounds. which subsequently exploded.

16. Reports were received of 3 accidents from ammunition Ammunition. causing injuries to 4 persons.

17. Nineteen accidents from fireworks were reported to this Department, Fireworks. causing 12 deaths and injuries to 20 persons. As usual, most of the accidents were caused by the handling of sulphur chlorate combinations of fireworks.

18. There were 15 accidents from petroleum causing 9 deaths and injuries Petroleum. to 8 persons. Fortunately none of the accidents were attended with any serious loss of life. There were two big fires from petrol, one at Bombay Harbour and the other at Budge Budge (items 48 and 50 of Appendix C). The transport of petrol by wooden barges is under consideration.

19. Details of 5 Government accidents were received during the year and do not call for any special comment. Government Accidents.

20. Two thousand one hundred and twenty-eight tons of explosives were Import of Explosives. imported into British India during 1907, the value being Rs. 22,15,475. Details showing the different kinds of explosives imported and the value of each are given in Appendix F. A comparative statement showing the quantity of explosives imported during the last 5 years is given in Appendix G.

21. During the year under report 132,661 gallons of dangerous petroleum and Import of Petroleum. 73,543,913 gallons of non-dangerous petroleum were imported by Sea into British India. The details are given in Appendix H, and also the quantity of dangerous and non-dangerous petroleum produced in Assam and Burma during the year.
22. The only amendment made to the Rules for the manufacture, possession and sale of explosives was that including "flare lights" used by Railway watchmen for signalling purposes in Rule 11 (3) (viii). The Government of Bombay has under Rule 17 (1) of the above rules authorised Commissioners of Divisions, the Commissioner of Sind and the Commissioner of Police, Bombay, to grant licenses for magazines. The Government of the United Provinces has also authorised Commissioners of Divisions to grant similar licenses.
23. The revised rules for the transport and importation of explosives, and those for testing explosives were finally issued by the Government of India with Department of Commerce and Industry Notification No. 4555-4, dated 31st May 1907. Amendments to Rules 17 and 18 were made in December 1907 permitting gunpowder, explosives of the 1st Division of the 6th ammunition class, and of the 7th firework class to be imported at the Port of Chittagong.
24. A list of explosives at present authorised for importation into British Authorised Explosives. India, for general sale, has been published in the *Gazette of India* for information. This list is given in Appendix I.
25. The consolidated petroleum rules, after having been scrutinised by an informal Committee, are still under consideration, and every hope is now entertained of the rules being finally issued within a few months. It is satisfactory to note that similar legislation is contemplated in the United States.
- Owing to the large use of petrol in an oil mill, the Government of Bengal amended their rules for the storage of dangerous petroleum so as to permit in special cases the possession of petrol in receptacles containing not more than 500 gallons each.
26. Motorine, which was included in the list of dangerous petroleum and Motorine. brought under the class of dangerous goods in the rules for working open lines of Railway in British India administered by Government, was found to be a lubricant and not dangerous petroleum, and was consequently removed from the list of dangerous goods in the rules.
27. The Railway Board decided that the rules for packing and carriage by rail of compressed gases which are in force in England Compressed Gases. should be adopted for India, subject to such modifications as the physical condition of this country may require, and that Compressed Hydrogen, Oxygen, Compressed Carbonic Acid Gas, and Compressed Air may be permitted to be carried by passenger train. The rules for working open lines of Railway in British India administered by Government were accordingly amended.
- Sulphuric Acid. 28. The rules for the carriage of sulphuric acid by rail were amended by the Railway Board during the year.
29. Chemicals supplied for all Government Departments in India through the agency of the Store Department of the India Office, London, were exempted by the Railway Board from the rules for the carriage of dangerous goods by rail, under certain conditions.
30. In view of the increasing use of gas for the lighting of public buildings, railway stations, etc., it seems expedient to warn Gas installations. persons in charge of such installations of the danger of controlling them by one general closing valve.

When the gas is turned off at day light by means of the controlling valve, the subordinates in charge of waiting or refreshment rooms, etc., do not trouble to turn it off also at the burners, with the result that the following evening at lighting up time gas is poured into these rooms through the burners until some one's attention is drawn to them by the smell of escaping gas.

Accidents are inevitable from this cause unless more attention is paid to this matter by those responsible. Nearly all reported gas accidents in England may be attributed to the neglect of servants to turn off gas at the burners.

31. The death of a soldier, owing to his having blown *down* a chimney  
Care and use of petroleum to extinguish a lamp, and other similar accidents, lamps. show that many people are still ignorant of the danger of this practice. These accidents show the possibility of blowing the flame down into the oil reservoir.

The suggestions issued by the Secretary of State in 1901 in this connection seem worth repetition.

"Lamps which have no extinguisher should be put out as follows:—The wick should be turned down until there is only a small flickering flame, care being taken not to turn down so far that the wick falls into the oil container. The small flame may be extinguished by placing a piece of flat tin or card on the top of the chimney, or by blowing *across* the top of the chimney. Never blow down the chimney."

Work of this Department. 32. This Department which was originally established to deal with explosives, is now chiefly occupied by questions in connection with petroleum.

I have the honour to be,  
 SIR,  
 Your most obedient Servant,

F. G. SMALLWOOD, *Major, R.A.,*  
*Officiating Chief Inspector of Explosives in India.*



## APPENDIX A.

List of Magazines and Licenses granted under Rule 17 of the Explosives Rules for the year 1907.

Presidency or Province.	District.	MAGAZINES.			LICENSES.		
		Under renewed license.	Under new license.	Total.	Renewed.	New.	Total.
BENGAL	Burdwan . . . . .	22	...	22	19	...	19
	Darjeeling . . . . .	3	...	3	3	...	3
	Gaya . . . . .	4	...	4	4	...	4
	Hazaribagh . . . . .	12	2	14	10	2	12
	Hooghly . . . . .	4	...	4	1	...	1
	Manbroom . . . . .	14	...	14	12	...	12
	24-Párganas . . . . .	1	...	1	1	...	1
	TOTAL . . . . .	60	2	62	50	2	52
	Ahmedabad . . . . .	2	...	2	2	...	2
	Bombay . . . . .	19	...	19	13	...	13
BOMBAY	Dharwar . . . . .	2	...	2	1	...	1
	Karachi* . . . . .	9	...	9	5	...	5
	TOTAL . . . . .	32	...	32	21	...	21
BURMA	Hanthawaddy . . . . .	3	...	3	2	...	2
	Mergui . . . . .	1	...	1	1	...	1
	Ruby Mines . . . . .	1	...	1	1	...	1
	TOTAL . . . . .	5	...	5	4	...	4
	Balaghat . . . . .	1	...	1	1	...	1
	Bilaspur . . . . .	1	...	1	1	...	1
	Chindwara . . . . .	1	1	2	1	1	2
	Jubbulpur . . . . .	3	...	3	2	...	2
	Nagpur . . . . .	3	1	4	2	1	3
	Narsingpur . . . . .	2	...	2	1	...	1
CENTRAL PROVINCES	Raipur . . . . .	4	...	4	4	...	4
	Saugor . . . . .	1	...	1	1	...	1
	TOTAL . . . . .	16	2	18	13	2	15
EASTERN BENGAL AND ASSAM	Cachar . . . . .	2	...	2	1	...	1
	Lakhimpur . . . . .	1	...	1	1	...	1
	TOTAL . . . . .	3	...	3	2	...	2
	Anantapur . . . . .	3	...	3	2	...	2
	Chingleput . . . . .	2	...	2	1	...	1
	Godavari . . . . .	2	...	2	1	...	1
	Kistna . . . . .	...	1	1	...	1	1
	Madras . . . . .	17	2	19	4	1	5
	Nellore . . . . .	4	...	4	2	...	2
	The Nilgiris . . . . .	4	...	4	2	...	2
MADRAS	North Arcot . . . . .	...	1	1	...	1	1
	Tanjore . . . . .	2	...	2	2	...	2
	Trichinopoly . . . . .	2	...	2	2	...	2
	Vizagapatam . . . . .	4	1	5	2	1	3
	TOTAL . . . . .	40	5	45	18	4	22
PUNJAB	Rawal Pindi . . . . .	1	...	1	1	...	1
	TOTAL . . . . .	1	...	1	1	...	1
	Cawnpur . . . . .	2	...	2	2	...	2
	Dehra Dun . . . . .	1	...	1	1	...	1
	Gharwal . . . . .	1	...	1	1	...	1
	Lucknow . . . . .	1	...	1	1	...	1
	Meerut . . . . .	1	...	1	3	...	3
	Shahjehanpur . . . . .	1	...	1	1	...	1
	TOTAL . . . . .	7	...	7	9	...	9
<b>SUMMARY.</b>							
BENGAL . . . . .		60	2	62	50	2	52
BOMBAY . . . . .		32	...	32	21	...	21
BURMA . . . . .		5	...	5	4	...	4
CENTRAL PROVINCES . . . . .		16	2	18	13	2	15
EASTERN BENGAL AND ASSAM . . . . .		3	...	3	2	...	2
MADRAS . . . . .		40	5	45	18	4	22
PUNJAB . . . . .		1	...	1	1	...	1
UNITED PROVINCES . . . . .		7	...	7	9	...	9
<b>GRAND TOTAL.</b>		164	9	173	118	8	126

\*At Karachi there is in addition a Roburite Factory licensed under Rule 15.

## APPENDIX -B.

\*List of non-dangerous petroleum installations licensed during the year, 1907.

Province.	District.	No.	Province.	District.	No.
Ajmer-Merwara . . .	Ajmer . . .	3	Bombay—contd. . .	Khandesh . . .	10
	TOTAL . . .	3		Nasik . . .	5
Baluchistan . . .	Quetta . . .	1		Poona . . .	3
	TOTAL . . .	1		Satara . . .	2
Bengal . . .	Balasore . . .	2		Sholapur . . .	4
	Bhagulpur . . .	5		Surat . . .	5
	Birbhum . . .	2		Thana . . .	4
	Burdwan . . .	7	Burma . . .	TOTAL . . .	76
	Calcutta . . .	3		Hanthawaddy . . .	3
	Champanar . . .	1		Mergui . . .	4
	Cuttack . . .	2		Mingyan . . .	1
	Darbhanga . . .	3		Pokoku . . .	3
	Darjeeling . . .	1		Thayetmyo . . .	1
	Gaya . . .	4		TOTAL . . .	12
	Howrah . . .	2	Central Provinces . . .	Akola . . .	6
	Khulna . . .	1		Amraoti . . .	8
	Manbhum . . .	1		Bhandara . . .	3
	Midnapur . . .	1		Bilaspur . . .	1
	Monghyr . . .	4		Buldana . . .	8
	Mozafferpur . . .	5		Chanda . . .	2
	Morshedabad . . .	1		Damoh . . .	1
	Nadia . . .	4		Hoshangabad . . .	4
	Patna . . .	4		Jubbulpur . . .	7
	Purnea . . .	2		Nagpur . . .	4
	Sambalpur . . .	2		Narsingpur . . .	3
	Saran . . .	2		Nimar . . .	5
	Shahabad . . .	3		Raipur . . .	1
	Santal Parganas . . .	5		Saugor . . .	3
	24-Parganas . . .	7		Sconi . . .	2
	TOTAL . . .	74		Wardha . . .	9
Bombay . . .	Ahmedabad . . .	6		TOTAL . . .	67
	Ahmednagar . . .	3	Eastern Bengal and Assam . . .	Backergunj . . .	1
	Belgaum . . .	4		Bogra . . .	1
	Bijapur . . .	5		Chittagong . . .	2
	Bombay . . .	3		Dacca . . .	1
	Broach . . .	4		Dinajpur . . .	2
	Dharywar . . .	11		Jalpaiguri . . .	1
	Hyderabad . . .	1		Mymensingh . . .	1
	Karachi . . .	6		Pabna . . .	2

\*This list includes some godowns for the storage of non-dangerous petroleum regarding which this Department has cognizance.

Province	District	No.	Province	District	No.
Eastern Bengal and Assam— contd.	Rajshaye . . . .	2	Punjab—contd.	Jullunder . . . .	1
	Rungpur . . . .	2		Lahore . . . .	3
	Sylhet . . . .	1		Ludhiana . . . .	3
	TOTAL . . . .	16		Rawal Pindi . . . .	3
Madras	Anantapur . . . .	2		Sialkot . . . .	3
	Bellary . . . .	4		Umballa . . . .	4
	Chingleput . . . .	3		TOTAL . . . .	23
	Coimbatore . . . .	6	United Provinces . . . .	Agra . . . .	4
	Cuddapah . . . .	1		Aligarh . . . .	1
	Ganjam . . . .	4		Allahabad . . . .	3
	Godaverry . . . .	5		Azamgarh . . . .	1
	Guntur . . . .	3		Bahraich . . . .	1
	Kistna . . . .	3		Bara Banki . . . .	1
	Kurnool . . . .	2		Bareilly . . . .	2
	Madras . . . .	5		Basti . . . .	1
	Madura . . . .	6		Benares . . . .	4
	Malabar . . . .	11		Cawnpur . . . .	3
	Nellore . . . .	5		Etawah . . . .	1
	North Arcot . . . .	2		Fyzabad . . . .	2
	Salem . . . .	3		Ghazipur . . . .	1
	South Arcot . . . .	7		Gonda . . . .	2
	Tanjore . . . .	7		Gorakpur . . . .	2
	Tinnevelly . . . .	6		Jaunpur . . . .	1
	Trichinopoly . . . .	2		Jhansi . . . .	3
	Vizagapatam . . . .	2		Lucknow . . . .	2
	TOTAL . . . .	89		Meerut . . . .	4
North-West Frontier Province	Peshawar . . . .	3		Moradabad . . . .	2
	TOTAL . . . .	3		Muttra . . . .	1
Punjab	Amritsar . . . .	3		Saharanpur . . . .	3
	Delhi . . . .	3		Shahjehanpur . . . .	2
				Total . . . .	47

## SUMMARY

**TOTAL** . . . . . 412

## APPENDIX C.

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1907 to 31st December 1907.

No.	Date of accident.	Nature of explosive.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS	
					Killed.	Injured.
<b>Explosives.</b>						
1	13th Feb. 1907	Gunpowder	Salem	The Magistrate reported that while a native was firing a salute from an iron tube charged with gunpowder a spark from the discharge exploded some gunpowder that was kept close by in a pot resulting in the death of the man.	1	"
2	25th Feb. 1907	Do.	Chidambaran	The District Magistrate reported that while a licensee in company with some others was pounding sulphur, saltpetre and charcoal in clay pots an explosion occurred so severely injuring them that they died from the effects.	8	"
3	28th Feb. 1907	Do.	Salem	The Magistrate reported that an iron tube was filled with gunpowder and clay and was being rammed with an iron crow-bar, when the charge exploded and a spark from it set alight some gunpowder kept close by on the ground injuring three persons.	3	"
4	4th June 1907	Do.	Bombay	The Commissioner of Police reported that a fire broke out in the premises of one Krishnaji Mukandas, licensed for the manufacture of country blasting powder. The hut, where manufacture was conducted, was made of jowhi leaves and was completely burnt to the ground. It contained 14 lbs. sulphur—28 lbs. of saltpetre and 56 lbs. charcoal. It is believed that the fire was caused by a servant of the licensee opening the door of the hut, while smoking a cigarette, and that sparks from the cigarette fell on some loose blasting powder, the remains of the previous day's manufacture.	"	"
5	5th April 1907	Gunpowder, Dynamite, etc.	Jatachapur, Chindwara.	The Deputy Commissioner reported that a building containing 161 dynamite cartridges, 183 detonators, 167 fuses and 17 seers of gunpowder, of which this Department had no cognizance suddenly exploded at night. No one was injured, though the building was of course demolished, and no explanation of the cause of the accident could be given.	"	"
6	17th June 1907	Do.	Mau	The Magistrate reported that when some women were engaged in manufacturing gunpowder an explosion suddenly occurred which was probably due to the presence of grit in the grinding mill.	6	"
7	20th June 1907	Gunpowder	Kavandam Poliam.	The Magistrate reported that while a native was manufacturing gunpowder a spark fell on the powder which caused an explosion.	"	"
8	10th Aug. 1907	Do.	Timvalur	The District Magistrate reported that a native loaded athervedis with a small quantity of gunpowder from a pot and handed the pot over to a boy. He then set fire to the athervedi before the boy had gone to a sufficient distance with the result that a spark fell into the pot of gunpowder, which exploded and six by-standers were injured, two of whom died from the effects of the injuries.	2	4
9	15th Aug. 1907	Do.	Goundampalaiyam.	The District Magistrate reported that while some natives were deepening a well by blasting, a native woman brought some fire near by and a spark from it fell on some gunpowder kept near the well which resulted in an explosion injuring three persons.	"	3
10	1st Sept. 1907	Do.	Avarappakkam	The District Magistrate reported that a native lad was engaged in charging athervedis with gunpowder when he asked another lad to get him a cigarette which a native was smoking at some distance. The lad in handing the cigarette accidentally dropped it into a pot of gunpowder, with the result that an explosion occurred causing injuries to eight boys who were sitting round, one of whom has since died.	1	7
11	7th Dec. 1907	Do.	Valasore, Salem	The District Magistrate reported that while two coolies were engaged in deepening a well by blasting, one of the men while charging one of the bore holes with gunpowder by means of an iron crow-bar, exploded the charge, which injured both men.	"	2
12	21st Aug. 1907	Dynamite	Jawatary, Nawa-dah.	A number of coolies were coming out of Jawatary mine after igniting the fuses of the dynamite charges which were being used for blasting. The fuse of one charge was wet and consequently this charge did not go off with the others and this was not detected. When two of the coolies were clearing away the debris, the charge went off, injuring them both.	18	20

No.	Date of accident.	Nature of explosive.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
<b>Explosives—continued.</b>						
13	2nd Nov. 1907	Gelignite cartridges.	Bombay	The Commissioner of Police reported that during blasting operations one charge appeared to misfire and after waiting for a couple of hours the operators made a search for it and as the search proved fruitless, boring operations were again commenced. Two men were working together with an iron crow-bar when it struck the misfired cartridges which exploded seriously injuring both men.	...	2
14	7th Dec. 1907	Dynamite	Elephanta	Contrary to Instructions a native drilled a bore hole near another misfired one. The hole that was being drilled ran into the misfired one which was in a sloping position and the man having struck the detonator caused the charge to explode.	...	1
15	27th Dec. 1907	Do.	Do.	A man was drilling a bore hole near a misfired one which was covered with moorum and was not noticed. The charge in the misfired hole was struck which caused it to explode.	...	1
				Total ...	...	6
16	16th Aug. 1907	Detonator	Arkonam	The District Magistrate reported that a native lad found a detonator near a well and in pressing it with a pencil to make it fit as a pencil case it exploded seriously injuring him.	...	1
17	23rd Aug. 1907	Cartridges	Bombay	The Commissioner of Police reported that while coolies were breaking up some cartridges which was done by jamming them by a process of beating them down with a hammer to prevent the consignor making use of them, one of the cartridges exploded injuring two coolies.	...	2
18	7th Sept. 1907	Explosive bullet	Calcutta	The Commissioner of Police reported that a native employed at Messrs Rodda & Co., in making explosive bullets, while swedging an explosive bullet containing powder seems to have by mistake put a bullet into too small a sized swedge where it got stuck and in trying to pull the bullet out it burst injuring him in the arm.	...	1
				Total ...	...	4
19	7th Mar. 1907	Fireworks	Poona	The District Magistrate reported that some natives were manufacturing fireworks the ingredients of which are not known, and while one of the men was ramming some of the ingredients into a bamboo tube with a small iron bar, an explosion occurred killing three of the men.	3	...
20	30th May 1907	Do.	Bombay	The Commissioner of Police reported that about 1 P.M. flames were seen coming down from a godown over a shop where fireworks were stored. The fire soon spread and three shops were completely gutted and the upper storeys of two other shops partially damaged. A report was current that the man who was in charge of the shop at the time lit a <i>biddie</i> or cigarette and threw the match amongst matches lying on the ground, but this report could not be substantiated.	...	...
21	11th June 1907	Do.	Calcutta	The Commissioner of Police reported that some coolies were employed in manufacturing bombs and after mixing the ingredients which consisted of nitrate of strontium, nitrate of barium, sulphate of copper, sulphur and chlorate of potash, a portion of the mixture was taken to a shop and put on trestle inside and about two hours after a noise was heard inside the shop and a blaze seen. Two men seated on the verandah of the shop were killed by the explosion and three of the neighbouring shops were burnt down, and three coolies who were close by were injured.	2	3
22	25th Sept. 1907	Do.	Calcutta, Bagan.	A native was holding a firework bomb in his hand and finding the paper enclosing it loose he twisted it in order to tighten it with the result that the bomb exploded causing injuries to his right hand.	...	1
23	4th Oct. 1907	Do.	Tuni	The District Magistrate, Godaveri, reported that while a native was carelessly mixing somesulphide of arsenic and chlorate of potash an explosion occurred and the man was killed on the spot.	1	...
24	15th Oct. 1907	Do.	Calcutta	The Commissioner of Police reported that a native had sustained injuries from an explosion of a firework consisting of saltpetre, sulphur, charcoal and iron filing which was discharged by another native.	...	1

No.	Date of accident.	Nature of explosive.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
<b>Explosives—concluded.</b>						
25	16th Oct. 1907	Fireworks	Calcutta	The Commissioner of Police reported that a native lad sustained injuries from the explosion of a bomb consisting of chlorate of potash, realgar and pieces of stone which was discharged by another native.	...	8
26	30th Oct. 1907	Do.	Bombay	The Commissioner of Police reported that while a native was mixing fireworks composition consisting of red arsenic, and chlorate of potash an explosion occurred so seriously injuring the man that he died shortly after.	1	...
27	31st Oct. 1907	Do.	Do.	The Commissioner of Police reported that four men were manufacturing detonators when an explosion occurred so severely injuring one of them that he died. Red arsenic and detonators were found on the premises, but no trace of any chlorate of potash.	1	...
28	2nd Nov. 1907	Do.	Calcutta	The Inspector of Police reported that a native lad sustained injuries from the explosion of a bomb consisting of chlorate of potash, sulphide of arsenic and pieces of stone.	...	2
29	5th Nov. 1907	Do.	Do.	The Commissioner of Police reported that a native who had some firework composition consisting of chlorate of potash and sulphide of arsenic in a phial in his left hand was striking some of the composition placed on a stone with another stone in the other hand, when the composition exploded and a spark entering the phial exploded its contents and all the fingers of his left hand were torn away. Another native who was near by was also injured.	...	2
30	6th Nov. 1907	Do.	Do.	The Inspector of Police reported that while a native was pounding some chlorate of potash, sulphur and sulphide of arsenic in a stone vessel with an iron pestle the composition exploded injuring him.	...	1
31	5th Nov. 1907	Do.	Bombay	The Commissioner of Police reported that a native girl was playing with fireworks when her clothes caught fire and she was so severely burnt that she died from the effects.	1	...
32	6th Nov. 1907	Do.	Calcutta	The Commissioner of Police reported that a native kept some powder in a piece of paper on the roof of his house, a bomb accidentally fell from his hand on to the roof and when he attempted to pick up the powder the bomb exploded and set fire to the powder which burnt his face and chest.	...	2
33	6th Nov. 1907	Do.	Do.	The Commissioner of Police reported that a native was seen cooking his food and seated 3 feet away from the stove making a bomb consisting of chlorate of potash and sulphide of arsenic. He was rolling some paper round a bomb and squeezing it when it exploded and killed him on the spot.	1	...
34	7th Nov. 1907	Do.	Do.	The Commissioner of Police reported that a native was manufacturing bombs consisting of chlorate of potash sulphide of arsenic and small stones, when one of the bombs exploded injuring him.	...	1
35	9th Nov. 1907	Fireworks consisting of chlorate of potash and red arsenic.	Nadia	The Magistrate reported that a native lad opened a number of bombs and put the contents into a metal tube and while pressing the ingredients with a bamboo stick an explosion occurred and injured the lad.	...	1
36	31st Oct. 1907	Chinese Crackers	Godhra	The Superintendent of Police reported that while a native was carrying a box of fireworks, it accidentally fell to the ground causing an explosion of its contents and fatally injuring the man.	1	...
37	3rd Nov. 1907	Bomb consisting of chlorate of potash and sulphide of arsenic and small stones.	Allanmyo	The Local Government reported that a Burman threw a bomb into the midst of a crowd that had collected on the bank of the river and notwithstanding the entreaties of the people on the bank he threw a second one which also exploded and did further damage.	1	7
Total					12	20
<b>Petroleum.</b>						
38	29th Feb. 1907	Do.	Crude oil	At about 9-45 P.M. one of the wells of the Assam Oil Company had just given a blow of oil. A native was walking past and quite close to the well at the time with a naked lamp, when the lamp ignited the gas and the oil which had flowed out flared up. The native was fatally injured and it was not till 5 the next morning that the oil had burnt itself out.	1	...

No.	Date of accident.	Nature of oil.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
<b>Petroleum—continued.</b>						
39	26th Mar. 1907	Petroleum	... Kabat	The Field Manager of the Burma Oil Company reported that the men were working about the oil well as usual when suddenly the water broke in from behind the pipe which released a gas vein that had been shut off by the pipe and considerable volume of gas appeared at the top of the bore, caught fire immediately, and before the men could all get away two coolies who were working in the cellar under the derrick were burned.	...	2
40	23rd April 1907	Kerosine	Ranaghat	The Magistrate reported that a bulk oil tank wagon caught fire through a native putting a hurricane lamp in at night through the roof-door to ascertain the quantity of oil in it.	...	1
41	13th May 1907	Do.	... Barsi road	The District Magistrate reported that a railway tank wagon was being emptied and about 9 P.M. a native with a lantern was seen moving in the vicinity of the tank. An explosion occurred setting fire to the tank and in time the fire spread to the drums of oil removed from the tank.	...	2
42	11th Aug. 1907	Kerosine and Tar.	Bombay Harbour	<p>The Commissioner of Police reported that at about 4.45 P.M., 12th August 1907, information was received that a fire had broken out on the steam mud boat "Pholas," which was lying alongside the Harbour Wall, opposite "K" shed, Prince's Dock.</p> <p>2 From enquiries made as to the cause of the fire, the Commissioner was of opinion that some of the crew of the mud boat "Pholas" must have been smoking and set fire to the canvas purdah. The fire then spread to the jolly boat, which was hanging to the stern and was thickly coated with pitch, tar, oil and black varnish.</p> <p>The burning pitch and tar, etc., streamed off the boat and fell into the sea.</p> <p>3. At the time it was noticed that there was a quantity of kerosine oil floating on the sea, from about <math>\frac{1}{4}</math>" to <math>\frac{1}{2}</math>" deep and this, coming in contact with the burning tar that was falling caused a great conflagration, which caught hold of the stern of the "Pholas" and slightly burnt it. The fire, which was then burning on the top of the water, gradually floated down and came in contact with another mud boat "Curlew" singeing her stern a little.</p> <p>The fire went out at about 5.15 P.M.</p> <p>4. Further enquiries were made as to the cause of the kerosine oil floating on the top of the water, and it was ascertained that there was a quantity of kerosine oil running into the sea through a drain at the Wari Bunder.</p> <p>The drain was traced to about the middle of the Bunder, where it was found that a large quantity of oil was leaking, most probably from the oil main pipe running near by; and the oil found its way to the drain, which emptied itself into the sea at the same Bunder.</p> <p>5. There appeared to have been a leakage in the main oil pipe, which runs from Stone Bunder to Sewri.</p>	...	...
43	2nd Oct. 1907	Crude Petroleum	Yenangyat	Two women were endeavouring to fill a lighted Burmese hand lamp from a kerosine tin containing crude petroleum when an explosion occurred; they were both fatally injured.	2	...
44	17th Oct. 1907	Kerosine	... Bombay	The Commissioner of Police reported that a tin of kerosine oil which was kept on the threshold of a shop caught fire and was thrown into the street. Unfortunately the tin fell near where two native children were playing and the burning oil splashing on them set fire to their clothes. They were severely burnt and one of the children died from the effects. No reason could be assigned for the cause of the fire.	1	1
45	18th Oct. 1907	Do.	Pandigon	The Sub-Divisional Officer, Magwe, reported that a cooly during the process of pouring oil on to a fire underneath a pipe to make it bend carelessly allowed the oil in the cup from which he was pouring it to catch fire. The fire caught his clothes which burnt him so severely that he succumbed to the injuries.	1	...
46	25th Oct. 1907	Kerosine	... Bombay	The Commissioner of Police reported that a native lad was purchasing some potatoes from a hawker with a handcart who was standing on the road side. The scales used for weighing accidentally upset a kerosine oil lamp which fell on the lad, setting his clothes on fire and burning him severely.	...	1

## APPENDIX D.

Detailed statement showing the number of accidents and persons killed and injured during the five years 1903 to 1907.

YEAR.	GUNPOWDER.			DYNAMITE AND OTHER NITRO-COMPOUND EXPLOSIVES.			AMMUNITION.			FIREWORKS.		
	No. of accidents.	Persons killed.	Persons injured.	No. of accidents.	Persons killed.	Persons injured.	No. of accidents.	Persons killed.	Persons injured.	No. of accidents.	Persons killed.	Persons injured.
1903 . .	5	9	1	7	5	18	...	...	...	20	8	26
1904 . .	11	25	30	5	3	10	1	...	1	13	10	9
1905 . .	7	6	3	10	6	19	...	...	...	15	13	26
1906 . .	13	21	28	2	1	2	...	...	...	11	4	14
1907 . .	11	18	20	4	...	6	3	...	4	19	12	20
<b>TOTAL</b> . .	<b>47</b>	<b>79</b>	<b>82</b>	<b>28</b>	<b>15</b>	<b>55</b>	<b>4</b>	<b>...</b>	<b>5</b>	<b>78</b>	<b>47</b>	<b>95</b>
<b>AVERAGE</b> . .	<b>9</b>	<b>16</b>	<b>16</b>	<b>5</b>	<b>3</b>	<b>11</b>	<b>1</b>	<b>...</b>	<b>1</b>	<b>15</b>	<b>9</b>	<b>19</b>

YEAR.	PETROLEUM.			CHEMICALS.			MISCELLANEOUS.		
	No. of accidents.	Persons killed.	Persons injured.	No. of accidents.	Persons killed.	Persons injured.	No. of accidents.	Persons killed.	Persons injured.
1903 . .	9	13	14	2	6	3	...	...	...
1904 . .	8	42	10	4	...	9	5	...	1
1905 . .	12	7	13	...	...	...	...	...	...
1906 . .	10	9	3	...	...	...	3	1	1
1907 . .	15	9	8	...	...	...	6	7	2
<b>TOTAL</b> . .	<b>54</b>	<b>80</b>	<b>48</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>14</b>	<b>8</b>	<b>4</b>
<b>AVERAGE</b> . .	<b>11</b>	<b>16</b>	<b>10</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>

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## APPENDIX E.

Comparative statement showing number of accidents and persons killed and injured during the five years 1903 to 1907.

Year.	ACCIDENTS CAUSING LOSS OF LIFE OR BODILY INJURY.			Accidents not causing loss of life or bodily injury.	Total Number of accidents.		
	Number of accidents.	Number of persons					
		Killed.	Injured.				
1903 . . . . .	35	41	62	8	13		
1904 . . . . .	40	80	70	7	47		
1905 . . . . .	40	32	61	4	44		
1906 . . . . .	34	36	48	5	39		
1907 . . . . .	50	46	60	8	58		
Total .	199	235	301	32	201		
Average .	40	47	60	6	40		

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## APPENDIX F.

Statement showing the import of explosives by sea into British India from other countries in the year 1907.

		IMPORTS IN 1907.						TOTAL
		Bengal.	Bombay.	Sind.	Madras.	Burma.	Eastern Bengal and Assam.	
QUANTITY.								
Gunpowder, black . . . lbs.	43,260	90,120	1,150	33,269	2,500	...	...	170,299
Do. smokeless . . . "	2,575	4,100	20,092	1,775	775	...	...	29,317
Dynamite . . . . . "	149,968	40,000	32,527	...	40,000	...	...	262,495
Blasting Gelatine . . . . "	...	6,000	24,000	1,055,050	...	...	...	1,085,050
Gelignite or Gelatine Dynamite . . "	5,040	...	...	170,000	...	...	...	175,040
Monobel powder . . . . "	...	...	...	...	...	...	...	...
Other nitro-compound explosives . . "	88,256	1,000	...	...	...	...	...	89,256
Detonators . . . . . Nos.	...	60,000	90,000	2,844,000	58,400	...	...	3,052,400
Fireworks . . . . . lbs.	...	2,304,178	14,846	58,979	68,425	...	...	2,446,428
TOTAL . . lbs.	289,099	2,445,398	92,615	1,319,073	111,700	...	...	4,257,885
TOTAL . . No.	...	60,000	90,000	2,844,000	58,400	...	...	3,052,400
VALUE IN RUPEES.								
Gunpowder, black . . . Rs.	36,250	41,528	462	14,405	2,980	...	...	95,625
Do. smokeless . . . "	7,983	15,682	22,659	5,900	2,820	...	...	55,044
Dynamite . . . . . "	1,21,488	31,800	19,303	...	33,500	...	...	2,05,091
Blasting Gelatine . . . . "	...	5,740	29,241	9,97,794	...	...	...	10,32,775
Gelignite or Gelatine Dynamite . . "	4,044	...	...	1,34,397	...	...	...	1,38,441
Monobel powder . . . . "	...	...	...	...	...	...	...	...
Other nitro-compound explosives . . "	52,208	730	...	...	...	...	...	52,938
Detonators . . . . . "	14,593	945	2,992	54,854	8,090	...	...	74,474
Fireworks . . . . . "	16,412	500,578	9,306	18,000	16,792	...	...	5,61,087
TOTAL . . Rs.	2,52,977	5,97,003	83,963	12,25,350	56,182	...	...	22,15,475

## APPENDIX G.

{ Comparative Statement showing the import of explosives by sea into British India from other countries during the years 1903 to 1907.

						IMPORTS IN				
						1903.	1904.	1905.	1906.	1907.
Gunpowder, black	...	...	...	lbs.		272,423	473,925	202,751	168,353	170,299
Gunpowder, smokeless	...	...	...	"		31,004	48,246	45,125 $\frac{1}{2}$	39,745	29,317
Dynamite	...	...	...	"		416,480	149,968	249,968	352,207	262,495
Blasting Gelatine	...	...	..	"		843,432	895,040	558,200	906,400	1,085,050
Gelignite or Gelatine Dynamite	...	...	"			22,096	55,048	123,048	132,594	175,040
Monobel powder	...	...	...	"		...	...	...	2,000	...
Other Nitro-compound explosives	...	...	"			222,104	130,811	109,475	72,921	89,256
Detonators	...	...	...	No.		4,388,400	3,020,000	1,797,000	5,536,000	3,052,400
Fireworks	...	...	...	lbs.		1,971,317 $\frac{1}{2}$	2,264,162	1,661,229	2,410,388	2,446,428
Total						3,778,856 $\frac{1}{2}$	4,017,200	2,949,796 $\frac{1}{2}$	4,084,608	4,257,885
Total						4,388,400	3,020,000	1,797,000	55,36,000	3,052,400

## APPENDIX H.

Statement showing the quantity of petroleum imported by sea into British India during the years 1905 to 1907.

## Non-dangerous petroleum.

	1905.	1906.	1907.
	Gallons.	Gallons.	Gallons.
Chittagong	3,970,269	1,822,051	5,547,944
Balasore	10,000	26,200	...
Chandbali	367,500	405,000	270,200
Calcutta	27,144,014	20,342,078	27,342,923
Bombay	22,099,928	17,402,913	22,439,071
Sind	5,157,947	5,007,932	7,171,933
Madras	9,765,384	6,956,459	8,942,869
Burma	1,595,209	1,156,179	1,828,973
Total	70,110,251	53,118,812	73,543,913

## Dangerous petroleum.

	1905.	1906.	1907.
	Gallons.	Gallons.	Gallons.
Chittagong	...	...	...
Balasore	...	...	...
Chandbali	...	...	...
Calcutta	14,500	...	12,270
Bombay	66,017	184,243	92,258
Sind	622	9,795	2,733
Madras	7,828	38,104	25,400
Burma	5	...	...
Total	88,972	232,142	132,661

Statement showing the quantity of petroleum produced in Assam and Burma during the years 1905 to 1907.

	Non-dangerous petroleum.			Dangerous petroleum.			
	1905.	1906.	1907.	1905.	1906.	1907.	
	Gallons.	Gallons.	Gallons.		Gallons.	Gallons.	Gallons.
Assam	1,543,212	1,890,942	1,975,094	Assam	21,014	21,855	48,017
Burma	67,062,170	95,848,500	75,397,762	Burma	11,988,220	125,356,400	15,043,700
Total	68,605,382	97,739,442	77,372,856	Total	12,009,234	125,378,255	15,091,717

## APPENDIX I.

## DEPARTMENT OF EXPLOSIVES.

## NOTIFICATION.

Dated Calcutta, the 12th March 1908.

No. 494.—With reference to Notification No. 4555—4, dated the 31st May 1907, of the Government of India, Department of Commerce and Industry, publishing rules to regulate the transport and importation of explosives, the following list of "authorized explosives" referred to in rule 9(1) of the above rules is published for general information:—

## LIST OF AUTHORIZED EXPLOSIVES.

The following explosives are at present authorized for importation into British India for general sale:—

## Class 1.—GUNPOWDER.

GUNPOWDER.

## Class 2.—NITRATE MIXTURE.

AMMONAL.

RIPPLENE.

## Class 3.—NITRO-COMPOUND.

Every explosive in this class and every explosive ingredient thereof shall be so thoroughly purified and otherwise of such character as to satisfy a test known as the heat test, and specified in the rule for testing explosives, published with Notification No. 4555—4, dated the 31st May 1907, referred to above.

*Division 1.*

ALBIONITE.

AMBERITE NO. 1.

BALLISTITE.

BLASTING GELATINE.

CARBONITE.

CELTITE.

CORDITE.

CORDITE, M. D.

DYNAMITE.

GELATINE DYNAMITE NO. 1.

GELATINE DYNAMITE NO. 2 OR GELIGNITE.

MONOBEL POWDER.

PHœNIX POWDER.

Provided that every explosive in this division shall be of such character and consistency as not to be liable to liquefaction or exudation.

*Division 2.*

AMBERITE NO. 2.

AMMONITE.

COOPPAL'S POWDER.

E. C. SPORTING POWDER.

EMPIRE POWDER.

GUNCOTTON.

HENRITE.

SCHULTZE GUNPOWDER.

KYNOCHE'S SMOKELESS SPORTING POWDER.

NEGRO POWDER.

PICRIC ACID.

## PICRIC POWDER.

RIFLEITE.

ROBURITE.

S. R. POWDER.

S. S. POWDER.

SMOKELESS POWDER.

SMOKELESS BLASTING POWDER.

## Class 4.—CHLORATE MIXTURE.

*Nil.*

## Class 5.—FULMINATE.

*Nil.*

## Class 6.—AMMUNITION.

*Division 1.*

SAFETY FUZES FOR BLASTING.

SAFETY ELECTRIC FUZES.

PERCUSSION CAPS.

RAILWAY FOG SIGNALS.

SAFETY CARTRIDGES.

*Division 2.*

CARTRIDGES FOR CANNON, SHELLS, MINES, BLASTING OR OTHER LIKE PURPOSES.

CARTRIDGES FOR SMALL ARMS WHICH ARE NOT SAFETY CARTRIDGES.

ELECTRIC FUZES.

FUZES FOR BLASTING WHICH ARE NOT SAFETY FUZES.

FUZES FOR SHELLS.

TUBES FOR FIRING EXPLOSIVES.

WAR ROCKETS.

*Division 3.*

CARTRIDGES FOR SMALL ARMS WHICH ARE NOT SAFETY CARTRIDGES.

DETONATORS.

ELECTRIC DETONATORS.

FUZES FOR BLASTING WHICH ARE NOT SAFETY FUZES.

FRICITION TUBES.

FUZES FOR SHELLS.

FUZES FOR FIRING EXPLOSIVES.

## Class 7.—FIREWORK.

*Division 1.**Nil.**Division 2.—Manufactured Fireworks.*

MANUFACTURED FIREWORKS.

AMORGES.

CHINESE CRACKERS.

F. G. SMALLWOOD, Major, R.A.,

Offg. Chief Inspector of Explosives in India.

G. C. B. P., Simla.—No. 1 C. I. E.—2-7-08.—650.—C. P.

